Pre - SYNOPSIS

Of the proposed thesis entitled

AN ANALYTICAL STUDY OF EFFECT OF LAMINAR MIXED CONVECTION FLOW IN VERTICAL PASSAGE CHANNEL

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BY

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Introduction:

Fluids plays a vital role in day-to-day life (liquid as well as gages), basically for human being we must know the characteristic properties of fluid. The air we breathe and the water we drink are fluids. Almost, our body contains fluids that are water based. Proper motion of these fluids in our bodies is very important and essential for good health. Our blood pressure is dependents of the flow of fluids in blood vessels.

In the 17^{th} century fluid mechanics was emerging source of huge knowledge studied by many famous scientists such as Bernoulli, Euler, Newton, D'Alembert's and many more. Concept of viscous force for Navier- stock equation in Fluid mechanics gives the extreme hike to the fluid dynamics. Fluid dynamics is a study of motion of fluids flow. basically, it is branch of physics and technology deals with the mechanics of fluid (Liquid, gases and Plasmas) & forces acting on them.

In our research work, we are going to study (analytically) the effect of the laminar Mixed convection flow in vertical passage channel. Liquid flow has different types of pressure, due to this pressure and its impact, we can observe the change in velocity and Temperature.

Literature Review:

Now a days may researchers have been attracted towards the field of fluid mechanics in particular Dynamics. Heat and Mass transfer by Natural convection in porous medium been studied by Bejan and Khair (1985). Coupled heat and mass transfer by mixed convection from a vertical plate in saturated porous medium, studied by Lai, F. C. in 1971. Later, coupled heat and mass transfer by Natural convection in from vertical surface in porous media has been studied by Lai, F.C. and Kulacki, F. A. in 1991.

In the experimental efforts Founti and J. H. Whitelaw used LDA to deduce the velocity field in an asymmetric heat exchanger with baffles on the shell side surface. [1] The similar distributions of the mean flow velocity and turbulent intensity were found after two sets of baffles from the channel entrance. And Berner et al in 1984. Mixed conventional flow in a vertical double passage channel filled with Nanofluid -A state of art has been studied by M. Awais and N. Ullah in 2021. Recently, Prathap Kumar et al. (2011a, 2011b) and Umavathi (2011) analysed the free convection in a vertical double passage wavy channel for both Newtonian and non-Newtonian fluids. A mechanical model of liquid sloshing was developed by Xu and Dai (2003) to investigate the longitudinal dynamic characteristics of partially filled liquid cargo tank vehicles during typical straight-line driving.

In various sector as like mechanical industry, pharmaceutical industry aeronautical industry even in agriculture, so may practical problems can be solved with the help of fluid Dynamics needs analysis of the behaviour of the contents of a finite region in space (a control) volume. For example, we may be asked to calculate the anchoring force required to hold a jet engine in place during a test. The bases of this analysis method are some fundamental principles of physics, namely conservation of mass, Newton's second law of motion and the laws of thermodynamics.

Thus, as one might expect, the resultant techniques are powerful and applicable to a wide variety of fluid mechanical circumstances that require engineering judgment.

Aim and Objectives:

- To analyse the effect of laminar convection flow in the vertical passage channel.
- To study the behaviour of the fluid when external force is applied.
- To study the temperature variation of the Fluid.
- To study the graphical beauty of various independent variables using mathematical software.

Research Methodology:

- ❖ Collection of Books and study of reference books related to our research work.
- ❖ Analysis of research paper related to our Research area.
- ❖ The basic governing differential equations of the flow and heat transfer are solved using the following techniques.

i.	Power Series Method.
ii.	Regular Perturbation method.
iii.	Finite Difference Method.
iv.	Shooting Method.

- ❖ Study and use of different mathematical software as like MATLAB, LaTeX, Scilab, R programming etc… related to my research work.
- ❖ Visit to various institutions and interact with eminent researchers and expertise's. in our relevant research area.
- ❖ Present research paper in conferences, seminar, symposiums, and workshops with innovation in our research area.

Importance of study:

Now a days we are observing tremendous change in an atmosphere such as increasing in temperature, heavy rainfalls in summer, melting of icebergs etc. and badly impact on the human life on the earths.

Our research work, "An analytical study of effect of laminar Mixed convection flow in the vertical passage channel" gives the idea in the flow of Fluids with change in pressure and respective changes of various parameters as like temperature, Viscosity, Density velocity, acceleration, surface tension, enthalpy etc. also in pharmaceutical company we must give proper pressure to get more accurate results of various medication and reduce our production costs. The important objective is in numerous engineering application of nano fluids and micro fluids such as pumping systems, chemical catalytic reactors plate fin heat exchangers, electronic cooling system etc.

Plan for Research:

Firstly, study of the basic concept of Fluid dynamics related to my research work. Take the literature review of concern work and collect material for research such from research journals, books, research articles, Online sources, different solve and unsolved problems etc. We must learn various research tools and complete course work. Study of various mathematical software and Tools and its practical application in our research work.

Define some terminologies such as force, dependent and independent variables. Develop some results in laminar convection flow in vertical double passage channel and verify the same. Formulate the results in mathematical model. Using the software draw the required graphs and make appropriate statement and conclusion.

Publish at least two research paper of our work in the national and international peer reviewed Journals.

Finally, submit final Synopsis and thesis to the university**.**

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